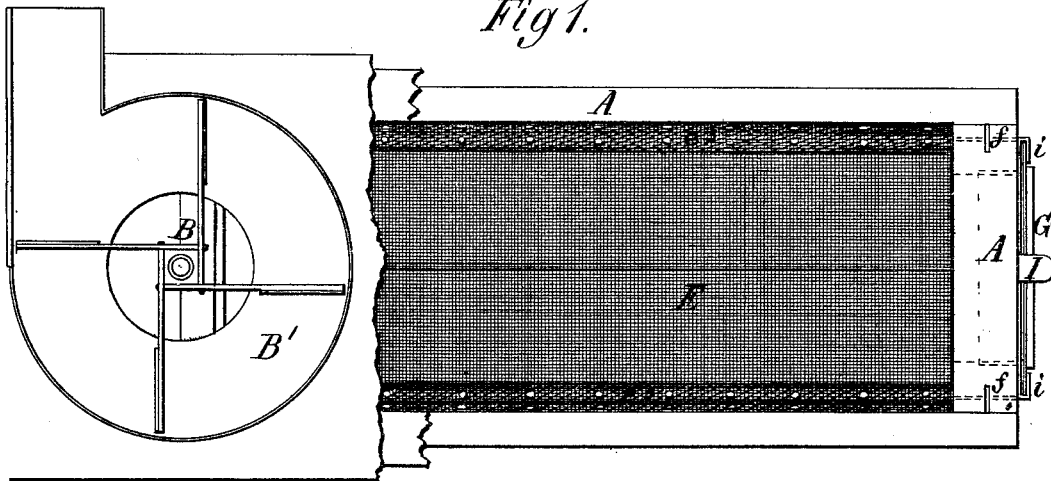


J. H. REDFIELD.  
Machine for Purifying Middlings.

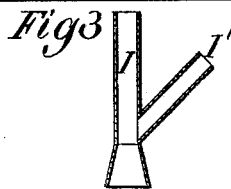
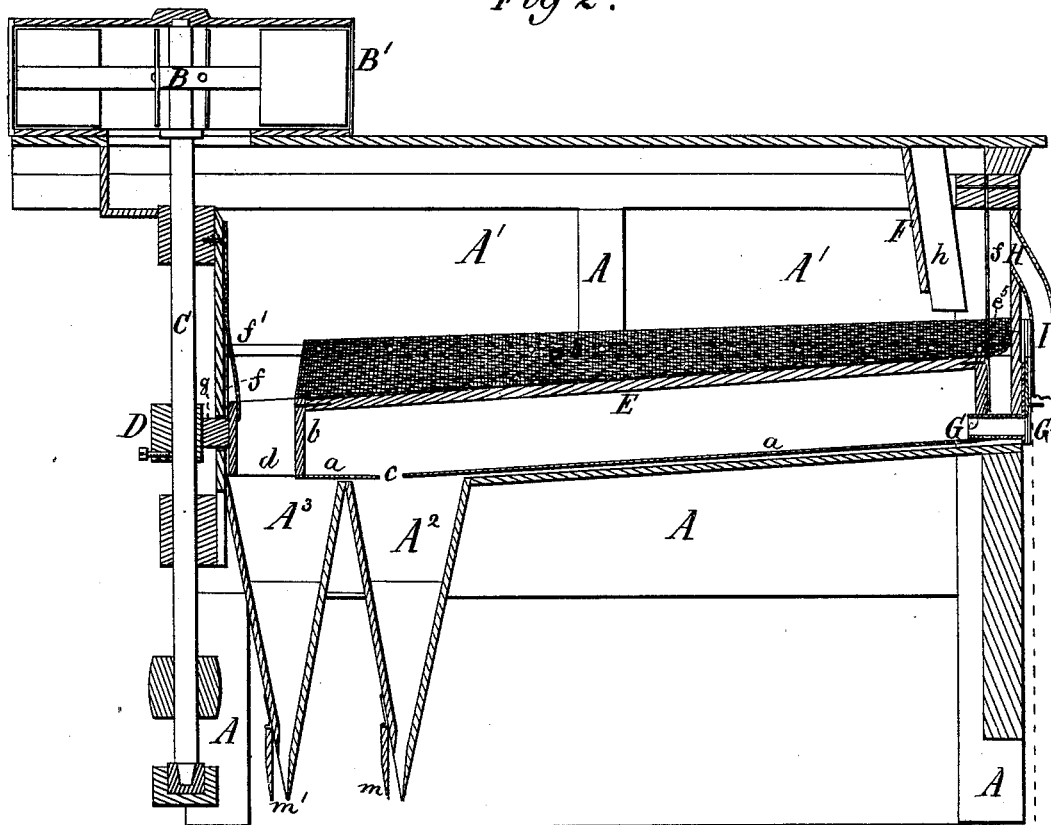
No. 214,314.

Patented April 15, 1879.

*Fig 1.*



*Fig 2.*



*Witnesses:*  
J. P. Theodore Lang.  
G. H. Theodore Lang

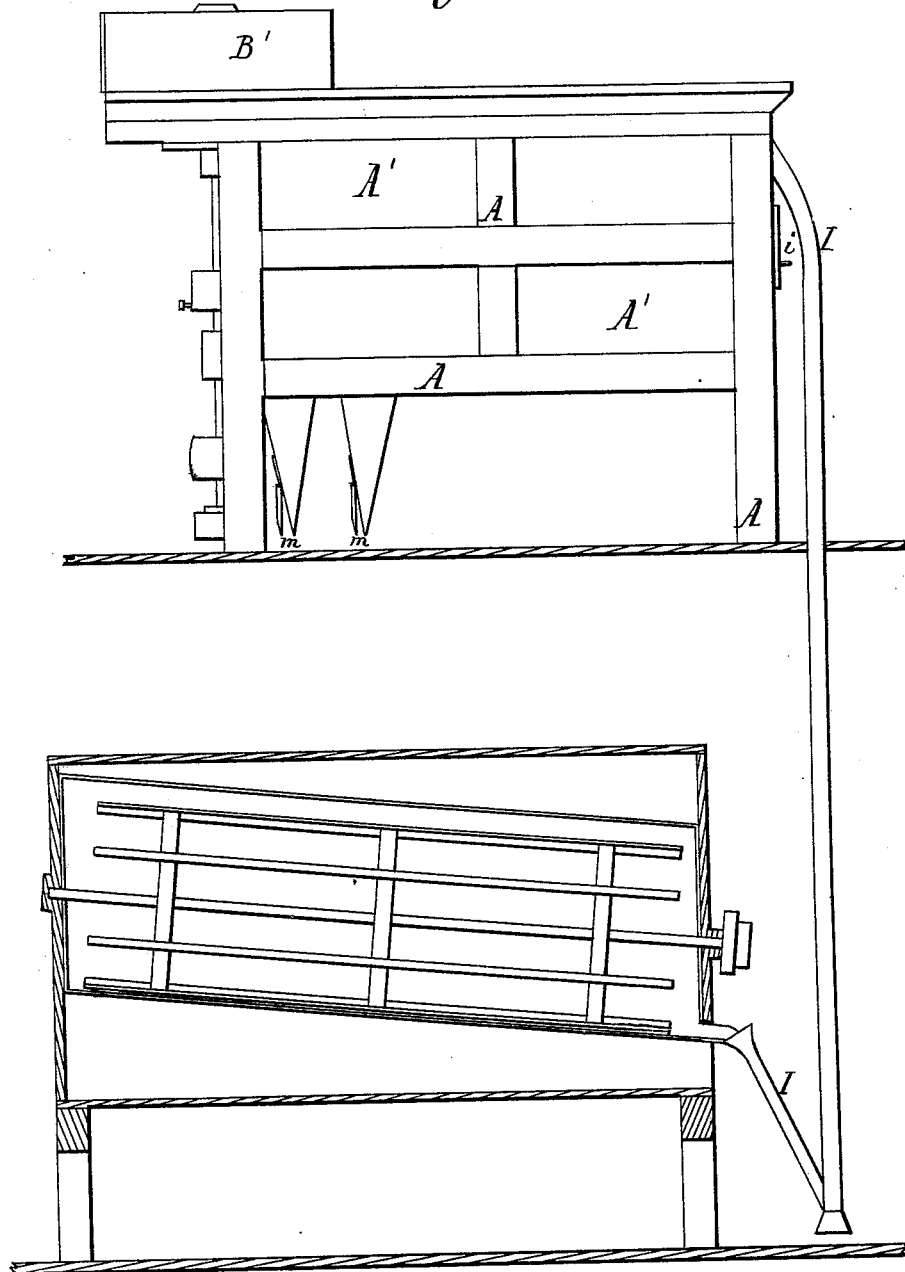
*Inventor:*  
James H. Redfield  
by  
Mason, Hewitt & Lawrence

J. H. REDFIELD.  
Machine for Purifying Middlings.

No. 214,314.

Patented April 15, 1879.

*Fig 4.*



*Witnesses:*

*G. P. Theodore Lang*  
*G. H. Theodore Lang*

*Inventor.*

*James H. Redfield*

*by*  
*Wm. Rawick & Lawrence*

# UNITED STATES PATENT OFFICE.

JAMES H. REDFIELD, OF SALEM, INDIANA.

## IMPROVEMENT IN MACHINES FOR PURIFYING MIDDINGS.

Specification forming part of Letters Patent No. 214,314, dated April 15, 1879; application filed January 18, 1879.

*To all whom it may concern:*

Be it known that I, JAMES H. REDFIELD, of Salem, Washington county, State of Indiana, have invented a new and useful Machine for Purifying Middlings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top view of the machine, with a portion of the casing and framing broken away in order to show the sieve. Fig. 2 is a longitudinal section of the machine; and Fig. 3 is a detail view of the foot section of pipe, by which the pipe through which the middlings are elevated is connected with the bolting machines or reels. Fig. 4 is a diagram illustrating the operation of my invention when the middlings are elevated thereby from the bolting-room to the middlings-purifier room.

The main object of my invention is to effect the elevation of the middlings from the bolting room or compartment of a flouring-mill to the room or compartment where the middlings are purified by means of the suction of a fan, which feeds the middlings to the purifier, instead of by expensive elevators of ordinary kinds, and to utilize the suction of the fan of a middlings-purifier for effecting this result simultaneously with the use of said suction of the fan for carrying the middlings through the purifying-machine for the purpose of purifying them.

Another object of my invention is to utilize the suction of a fan for both supplying the middlings to the purifying-machine and carrying them through said machine, and also for inducing a constant current of air to flow into the purifier below the separating-sieve, for the purpose of keeping the lighter and larger particles of the middlings in suspension above the sieve until they finally become deposited into a receptacle provided for them, thus keeping the sieve open for the passage through it of the finer and white particles of the middlings on their way to the receptacle provided for them.

Another object of my invention is to effect a uniform distribution of the middlings upon the separating-sieve by a transverse chute-board suspended above the sieve and made

pendent from the top portion of the purifying-machine, and operating in combination with a suction-fan, which forcibly draws the middlings into the machine against said distributing-board.

Another object of my invention is to provide a middlings-purifier of very simple construction by certain combinations and arrangements of parts, as will be hereinafter described and specifically claimed.

A A' in the accompanying drawings represent the frame and casing of the middlings-purifier; B, the suction-fan placed on top at one end of the frame and casing, and with its case B' in communication with the chamber formed by the framing and casing A A'. The chamber formed by the framing and casing A A' is made as nearly air-tight as possible at all points, except when provision is specially made for the entrance and escape of air and of the middlings. C is the fan-shaft, provided with an eccentric, D, for vibrating the sieve E. To the front end and to both sides of the sieve at the top a cloth or other flexible diaphragm, *e*<sup>2</sup>, is tacked, and the outer side edges and end of this diaphragm are tacked to the sides and front end of the casing and frame A A'.

The amount of flexible diaphragm provided between the casing and framing A A' and the sieve-frame is greater than is required to fill the space between the sieve-frame and framing and casing A A', and this is done in order that the sieve may be vibrated without tearing the flexible diaphragm away from the fastenings, and at the same time the passage of middlings down between the edges and front end of the sieve and the casing A A', as well as the passage of air through the spaces covered by the diaphragm, is prevented. The sieve-frame is in form of an oblong box below the bolting-cloth, and the bottom portion, *a*, of this box is of metal and inclined downward from the receiving end of the machine; and at the end of the metal bottom plate, *a*, a transverse partition, *b*, is provided, and forward of and also beyond this partition discharge-openings *c d* are formed in the bottom of the sieve-frame, and under these openings are discharging-spouts A<sup>2</sup> A<sup>3</sup>, with valves *m m'*, arranged as shown.

The sieve is suspended loosely in the framing and casing A A' by means of flat pendent springs *f f*, attached to it and to the front and rear ends of the casing A', and its back movement is aided by these springs and another spring, *f'*, which produces a counteracting effect upon the sieve when it is being moved by the eccentric, and when the eccentric is moving out of its way it causes the sieve to move in a reverse direction from that in which it is moved by the eccentric.

The sieve is provided with an abutment, *g*, which passes through the discharging end of the machine, and comes in contact with the eccentric D. From the inner side of the top of the casing A', near the receiving end of the machine, a transverse distributing-board, F, is placed so as to incline backward and downward. This board has two side guards, *h*, which prevent the middlings from flying off laterally after they strike the board. The lower end of this chute-board is situated a short distance above the bolting-cloth of the sieve E, in order that the middlings may pass in a thin sheet beneath it over the sieve. At the receiving end of the machine the inlets G and H are provided, the inlet H being for the entrance of middlings into the machine, and located above the sieve E, and the inlet G being for the entrance of air beneath the bolting-cloth of the sieve, and located between said cloth and the bottom plate of the sieve.

In the inlet H a long tube, I, which is open at its lower end and adapted for being connected with a bolting-reel, is inserted, and over the inlet G a regulating slide or valve, G', is placed, so as to be raised and lowered in guides *i i* of the case A', as shown.

The long tube or pipe I may be passed down through the flooring of a middlings-purifying chamber to the bolt or bolting-machines of a bolting-chamber of a mill, and connected with the discharging-spout of the bolting-machine by means of a branch pipe, I', which is above the end of the pipe I. The pipe I is left open at its lower end, in order that air may flow into it and pass along with the middlings into the purifying-machine. The valve or slide G' serves for regulating the supply of air to the fan from beneath the bolting-cloth of the sieve.

Operation: The middlings-purifying machine being constructed as nearly air-tight as possible, except as hereinbefore specified, its tube I I' connected to operating bolting reel or reels situated below it, and the valve G' opened, the fan-shaft is set in motion by a belt passed around its pulley. The suction of the fan causes a partial vacuum in the machine, and the air, rushing in through the tube, I, conveys the middlings up the tube and into the machine above the sieve E. At the same instant a volume of air is drawn into the middlings-purifying machine through the inlet G beneath the sieve-cloth. As soon

as the middlings enter the purifying-machine they strike the distributing chute-board F, and are spread into a sheet and deflected downward upon the sieve, and, by the suction of the fan, drawn under the chute-board and over the surface of the sieve-cloth, and in their passage over the sieve-cloth they are subjected to the action of the air which is drawn by the fan up through the sieve-cloth, and thus the heavier and white particles of the middlings are separated from the larger and lighter particles, and the heavier and white particles pass down through the sieve into the receptacle A<sup>2</sup>, while the other particles pass over the end of the sieve into the receptacle A<sup>3</sup>, from which receptacles they are discharged through the passages covered by the valves *m m'*.

It is believed that it is new to elevate and feed middlings to the purifier by means of a suction-fan, for, as far as it is known to me, it has invariably been the practice to set the purifier in mills above the point where the middlings run from the bolts, and under such mode of operation expensive elevators for receiving and carrying up the middlings to the purifier have been employed. My invention avoids this expense to a very great extent, for, under my mode of operation, it requires only a tin pipe about three inches in diameter, at a cost of about eight cents per foot, to be extended down from the purifier far enough to be connected with the bolts, as illustrated by the diagram drawing, Fig. 4.

What I claim is—

1. A middlings-purifier provided with a suction-fan, and a tube for conducting middlings into the purifying-chamber, whereby the middlings are elevated to the purifier by the suction of the fan, substantially as set forth.

2. A middlings-purifier provided with a suction-fan, a middlings-conducting tube, and a passage for supplying air beneath and up through the sieve, whereby the middlings are elevated to the purifier, and are separated while moving above the surface of the sieve by air admitted up through the sieve, one fan causing the suction for both elevating and purifying the middlings, substantially as described.

3. The combination of the sieve E, the distributing-board F, the suction-fan B, the tube I, and passages G H, substantially as and for the purpose described.

4. The combination of the suction-fan B, sieve E, distributing-board F, conducting-tube I, air-passages G H, and valved receptacles A<sup>2</sup> A<sup>3</sup>, substantially as and for the purpose described.

JAMES H. REDFIELD.

In presence of—

THAD. HUSTON,  
OLIVER STANLEY.